

VENDING MACHINE AND COMPUTER ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATION

This application is a continuation-in-part application of prior application Ser. No. 08/429,583 filed Aug. 17, 1995, now abandoned.

FIELD OF THE INVENTION

The present invention is directed to a vending machine for purchasing merchandise while providing the customer via an internal computer with access to the internet or other on-line computer database and allowing the customer to interface with the internet address. More particularly, the invention is directed to a retrofit door assembly for attaching to an existing vending machine where the retrofit door includes a computer assembly to connect with the internet automatically in conjunction with the purchase of merchandise.

BACKGROUND OF THE INVENTION

Vending machines have been in common use for many years for purchasing a variety of items. These vending machines typically have a plurality of selector buttons or switches to allow the customer to select a specific item. Vending machines have also been produced to display advertising material from an electronic data storage unit at the time of purchase of the item.

Home computers are also in common use today for obtaining vast quantities of information from various databases. There are large numbers of database accessible by home computers through the use of a modem or other cable or telephone connection. In recent years the internet has become widely accessible by home computers for providing information to the user. Internet sites provide new entertainment and other sources of information.

Many vending machines provide vending for cans, bottles, hot and cold drinks in cups, sandwiches, candy, combs and different products. In addition to providing vending, other vending machines allow access to information which is localized and therefore, has limited use.

In recent years, there have been improvements in vending machines, including advertising, and interactive customer communication. For example, three such machines are exemplified by U.S. Pat. No. 4,454,670 to Bachmann, et al., International Patent No. PCT/AU89/00051 to Vogel, et al., and U.S. Pat. No. 4,677,565 to Ogaki et al. These patents disclose vending machines that have prerecorded programs on tape cassettes or diskette in a tape or diskette drive of the machine and a screen. The menus from the diskette, displayed on the screen, provide interactive user interface by way instructions, operation and use of the vending machine, advertising, and video games.

The vending machines mentioned above have been successful and have achieved their designed objectives but the amount of information available to the customer is limited by pre-recording.

SUMMARY OF THE INVENTION

The present invention is directed to credit card, bill, and coin-operated vending machines and vending machine doors for purchasing merchandise such as soft drinks in bottles, plastic containers or cans as well as any other item or merchandise which can be purchased through a vending machine. More specifically, the present invention provides a

vending machine for purchasing an item while providing the customers with interactive access to the internet, homepages, websites or other on-line computer service with audio, video capabilities, and multi-media capabilities. Further, the vending machine can transmit and receive data, with transmission and downloading capabilities of audio and video signals, using read and writable laser-disc or CD-ROM, and 1.44 MB diskette. Finally, the vending machine provides entertainment in addition to the vital information needed in the present technological age. The vending machine is reliable, efficient, fast operation and is manufacturable at relatively low cost.

An object of the present invention is to provide a credit card, bill or coin-operated machine for dispensing a selected item and includes a computer assembly for enabling the customer access to the internet, websites or home pages or other on-line computer database.

An additional object of the present invention is to provide a flat panel super video graphic adapter screen for providing video interactions by the customer with the internet.

An additional object feature is to provide stereophonic speakers for audio display of signals received from internet site.

A further object is to provide a telephone connection, cable, modem or an antennas such as satellite receiver or satellite disc mounted on an isolated vending machine for accessing the internet address.

Another object of the present invention is to provide a vending machine with computer-controlled panel keyboard and monitor to provide two-way interactive visual communications by a customer with the internet. By way of example and not limitation, the panel keyboard allows the addresses of the internet, web sites or home pages to be entered by the user into the computer for connecting the computer with an internet address.

A further object of the present invention is to provide a vending machine and computer assembly, with a trackball or mouse to provide two-way interactive visual communications between the customer and the internet address through the video monitor. By way of example and not limitation, the trackball allows the pages of websites or homepages to be browsed as well as other computer functions and operations using known software and hardware.

Still another object of the present invention is to provide a vending machine with a programmable selection panel for setting web sites or home pages for selected internet sites to provide, for example, a music function, news function, and audio and visual recording functions. By way of example and not limitation, the customer actuates the selection panel on the vending machine to access the present news on a homepage of a satellite news broadcast, or access the homepage of a musician, a political candidate, local government or the like.

A further object of the present invention is to provide a vending machine with read and writable laser-disc or CD-ROM player and 1.44 MB diskette driver to provide audio and video interaction between customer and machine and also to provide a means to allow the customer to download data, audio and video from a website, homepage or other on-line computer service. By way of example and not limitation, a customer can download data from a financial house or news from a broadcast company, and music and video from the homepage of a musician.

A further object of the invention is to provide a vending machine with a camera system to record the live performances of customers to be captured for TV commercial and

for audition. By way of example and not limitation, a customer can access a homepage of a company and audition for a TV commercial for promotional use or by two-way performances via the internet.

A further object of the present invention is to provide a vending machine for accessing the website or the homepage information of a vendor at the location of the vending machine via the internet when the item or merchandise selection is made. By way of example, the homepage of a city or locality is displayed on the monitor for a vending machine located in city hall.

These and other objects of the invention are basically attained by providing a storage unit for storing a plurality of different items for sale and a dispensing mechanism for dispensing the items from said storage unit; a selector device for selecting one or more of said items for sale by a customer; a payment-control device for detecting an amount of payment required for sale of an item and for actuating said dispensing mechanism when a payment is received to dispense a selected item; and a computer assembly having a computer, video display screen and a modem, whereby said computer is connected to and actuated by said selector device for automatically connecting said computer to a pre-selected internet address or on-line computer service and automatically displaying information transmitted and received from said internet address or on-line computer service on said video screen for viewing by the customer.

These and other embodiments, features and advantages of the present invention will become apparent from the following detailed descriptions in addition to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring to the drawings which form a part of this original disclosure.

FIG. 1 is a front elevational view of the front panel portion of an alternative vending machine door;

FIG. 2 is a front elevational view of the front panel portion of an alternative vending machine door;

FIG. 3 is a front elevational view of the front panel portion with a logo or trademark applied to the vending machine;

FIG. 4 is a functional block diagram of the computer operated vending machine of FIG. 1, illustrating a background central control unit and other components of the computer assembly and vending machine;

FIG. 5 and FIG. 6 show the flow block diagrams of the operation according to the present invention;

FIG. 7 shows a screen display at an initial stage when a target merchandise is to be selected;

FIG. 8 shows a screen display at the scene when a merchandise is selected;

FIG. 9 shows a screen display at the scene after a merchandise has been purchased and delivered;

FIG. 10 shows the screen display at the scene when a selection of FIG. 9 is made;

FIG. 11 shows a screen display at the scene when the scene of FIG. 10 is completed;

FIG. 12 shows the screen display scene when No. 1 of FIG. 11 is selected;

FIG. 13 shows the screen display scene when No. 2 of FIG. 11 is selected.

DETAILED DESCRIPTION OF THE INVENTION

Referring to the drawings, the vending machine 10 of the invention includes a front door 100 having a front panel 150.

Typically, front panel is flat but can be any desired shape or structure. The vending machine 10 includes a payment control device 152, selector device 154, a merchandise or item storage unit dispensing mechanism 156, and a computer assembly 158.

The item storage unit and dispensing mechanism 156 can be any standard assembly commonly used in vending machines and will not be discussed in detail. Examples of vending mechanisms are disclosed in U.S. Pat. Nos. 4,454,670; 4,677,565; 4,954,697; and 4,380,130 which are hereby incorporated by reference in their entirety. The storage unit and dispensing mechanism is connected to and operated by the computer assembly 158.

The computer assembly 158 includes a video monitor or screen 101, actuating buttons 120, 121 and 112 of the selector panel 160, a key pad 118, trackball 117, CD-ROM drive 116, and a diskette drive 128. The computer assembly 158 is connected to and actuated by the selector assembly 154 such that when the customer selects an item to be purchased the computer is automatically activated to be operated by the customer. In one embodiment of the invention the computer is pre-programmed so that when an item is selected for purchase, the computer automatically connects to a pre-selected internet site or website and displays the information received from the internet site on the video monitor. For example, the computer can be programmed to connect to a website or homepage of the manufacturer of the item purchased, or the website or homepage owner or operator of the vending machine. In further examples, the computer can connect to the website or homepage of a local or national news or sports network or the like. In preferred embodiments, the computer will include a suitable timing device to provide the customer with a predetermined amount of time to view the displayed information and provide interactive communication via the computer. Additional time can be obtained by the user by further payment to the vending machine. In further embodiments, information stored in a suitable data storage unit, such as a CD-ROM can be used for displaying information to the customer on the video monitor. As used herein, the term internet refers to the numerous computer databases and on-line services available for public access for retrieving and/or sending information.

The vending machine door 100 is provided with an escutcheon plate 123 and a flat plastic transparent plastic panel 162 with suitable back lighting and coloring (not shown) configured to display a primary product logo or trademark of the vendor or manufacturer and to increase the visibility of the vendor. In one embodiment of the invention, the door 100 is constructed as a retrofit to an existing vending machine. In this embodiment, the computer assembly 158 and money acceptor 152 are mounted in the door and assembled to cooperate with the existing dispensing mechanism 156 of the vending machine 10.

The vending machine door 100 includes the video graphic screen 101 to provide the visual illustrations in color to enable the customer two-way interactive communication functions. By way of example, the screen 101 may be a flat panel super video graphic adapter active matrix video screen that allows the customer to browse websites, homepages, and stored video images at photo realistic images of over sixteen million colors. The screen 101, as will be described later, is also used to display instructions to the customer for operation of the vending machine and to provide information for sales, purchasing and internet operations. When the machine is idle, a suitable vendor message is periodically delivered on screen 101 from the data storage unit of the computer.

The machine door 100 of the present invention further includes two speakers 102 and 103 connected to the com-

puter assembly 158 that are operable to present audio to enable the customer to interact with the vending machine screen 101 and computer assembly 158. The speakers can be, for example, stereophonic speakers to allow the customer to listen to stereophonic music from website of musicians.

By way of example, the system of FIG. 1 also includes a plurality of selector buttons or switches 120, 121 and 122 connected to the computer assembly 158 to enable the customer to log onto preprogrammed internet sites, such as news, financial, or video music websites and homepages.

The vending machine and system of FIG. 1 of the present invention also includes keypad 118 connected to the computer assembly 158 to allow the customer to engage in the interactive visual communication on the screen 101. Using the keypad 118, the customer can enter information to access the internet and access and browse websites and homepages, and to receive and transmit data to a remote suitable receiver capable of receiving and utilizing data such as a facsimile or another computer equipped with a facsimile board.

A trackball 117 is connected to the computer 158 for use by the customer in the interactive visual communication functions on the screen 101. By way of example, the customer can use the trackball 117 to browse websites and homepages, gain access to internet, data, audio, and visual signals at the control location of the vending machine.

The vending machine door 100 of the present invention is further provided with a laser-disc or read and writable CD-ROM drive 116 and 1.44 MB diskette drive 128 connected to the computer 158 to enable the customer to download audio and visual signals from websites and homepages, and to receive data from remote data transmitters. Using drives 116 and 128 the customer may also send audio and video messages to websites and homepages, capable of receiving information and to transmit data to remote receivers.

In accordance with this invention, a camera 124 is mounted on the door 100, and headphone and microphone 126 are provided for generating audio-video signals of the customer. The camera 124 and microphone 126 are connected to the computer and a video and audio receiver and storage unit for recording the audio visual signals from the customer. By way of example and not limitation, camera 124 allows the customer to audition for a movie studio or a TV commercial through the internet access. Alternatively, the customers can connect the computer to an internet site and receive music from the site. The customers can then sing into the microphone with the customer's voice and music recorded on a CD or other recording medium.

The escutcheon plate 123 of the present invention is provided with a credit card reader 105 with indicator 104, a bill reader 107 with indicator 106, coin acceptor 109 with indicator pad 108 indicating the amount of money deposited, a coin return lever 125, a coin return/delivery receptacle 114 for change or return of coin, a blank compact disc and blank diskette delivery port 130, and a purchased item delivery port 115. Selection switches 110, 111, 112, 113 are connected to the computer to display information about any of the available merchandise for sale and for purchasing merchandise. The selector switches correspond to the selection buttons of a conventional vending machine. Selector switch 131 displays information about or purchase of blank diskette or compact disc. The credit card reader and indicator 104, the bill reader and indicator 106, the coin acceptor 109 and indicator 108, the coin return lever 125, the coin delivery receptacle 114, and the merchandise delivery port 115 are similar to those employed in the conventional vending machines.

The present invention may also be provided with the window 133 for pricing information for merchandise, pricing information for accessing the internet and how long the customer may access the internet when a purchase is made, as well as other instructions for the customer. Once the correct amount of money has been deposited for the selected merchandise and a selector switch activated, the homepage of the vendor, the internet access, pricing information, or all the special instructions in connection with the initiation to access websites and homepages are displayed on the monitor 101. The selector switches actuate the dispensing device to dispense the purchased item.

The present invention, as shown in FIG. 1, is provided with a communication network, such as, an antennae, satellite disc 119 with satellite receiver 127 connected to the computer assembly 158 by a cable 129, for automatic transmit-receive data and audio-video signals, and to enable access to the internet through the use of the antennae, a modem, and other necessary hardware and software.

A further embodiment of the present invention, shown in FIG. 2, is similar to FIG. 1 except that the communication network 219 may be a cable connecting the computer to a television signal provided at the vendor's location or a telephone line for the transmit-receive of the data, audio-video signals, and access to the internet. Alternatively, the communication network 219 may be any other suitable transmit-receive circuit. The remaining elements are substantially the same as in the embodiment of FIG. 1 and are identified by the same reference number of the 200 series.

FIG. 3 is a further embodiment similar to FIG. 1 except that FIG. 3 includes the panel with suitable bright light and coloring configured to display the primary product logo or trademark 350 and to increase the visibility of the vendor. The remaining elements are substantially the same as in the embodiment of FIG. 1 and are identified by the same reference number of the 300 series.

Referring to FIG. 4, the interrelationship between the various circuit components is shown. The central computer control unit 400 is connected to and operates the various components of the vending machine. The computer 400 is connected to and controls operation of the display monitor 424 screen which includes a video interface circuit 427. Two-way audio communication functions and the production of messages amplified by amplifier are played on the speakers 420 and 421 and headphones 430. The computer 400 also receives input signals and calculates the payment amount from the credit card acceptor 401, bill acceptor 402 and coin acceptor 403 (collectively identified as amount deposit acceptor 400A) and receives signals and communicates with merchandise selector switches 405, 406, 407 and 408 (collectively identified as merchandise selector switch 400B). A driving means for a coin and change return mechanism 404 and the merchandise storage and dispensing unit 409 are controlled by the computer 400. Laser-disc and CD-ROM drive 415 and 1.44 MB diskette drive 428 (collectively referred to read-write drive 400D) are connected to computer 400 for receiving and storing data and for storing suitable software for driving the computer 400. A memory unit 417 and programmable audio-video message storage unit 416 can comprise of magnetic or optical recording medium or electrically erasable and programmable read-only memory (not shown). In embodiments of the invention, computer 400 incorporates a suitably programmable micro-processor or digital signal processing unit with appropriate interface circuits as known in the art for efficient computer operation and connection to the internet.

The programmable audio-video message storage unit 416 stores all the display names of the merchandise and pricing

checks, all the customer instructions in connection with the initiation and usage of the internet access and the vendor homepage or website that displays a window on the monitor 424 at the time of sale. The scratch pad memory unit 417 serves as the area where other website or homepage messages are stored temporarily while the customer browses the website or homepage. The read-write drive assembly 400D sends audio-video signals to the monitor 424 and other websites or homepages via computer 400 and records audio-video messages from other websites or homepage.

The computer 400 receives signals and data of deposited amounts of money from the amount deposit acceptor 400A, and signals to and from the merchandise selector switch 400B. When the customer activates a selector switch 400B the computer sends a signal to actuate the merchandise storage and dispensing unit 409.

The present invention is provided with vendor preprogrammed websites selector or switches 411, 413 and 414 (collectively referred to as the programmed website selector 400C). By pressing any of the programmed website selector 400C, the computer is connected to the website and the received information is displayed on the monitor 424.

Additionally, the present invention is provided with the keypad 412 to enable the customer select a website or homepage by entering the address of the website or homepage and other necessary information into the computer 400. The keypad 412 can be used by the customer for the two-way interactive communication functions with monitor 424 and computer 400. The invention is provided with a trackball 410 or mouse that enables the customer to browse the internet for two-way interactive communication functions with the monitor 424.

The microphone 422 with audio synthesizer 425, and video camera 423 with digital synthesizer 426 provide two-way audio-video interaction communication functions. By way of example and not limitation, the microphone 422 and camera 423 may allow the customer to perform live as an audition for TV commercial or movie studio at remote website location. The amplifier 419 for the speakers 420 and 421 and headphones 430 has audio interface circuit 418 connected to the computer 400. The system of FIG. 4 also includes transmit-receive network 429 for the transmission and receiving data, audio-video signals, and access to the internet information. By way of example and not limitation, the network 429 in a remote vending machine is provided with a satellite receiver and satellite disc. Alternative network 429 is a cable or telecommunications connection.

The FIG. 4 vending machine is provided with the diskette switch 431 and the compact disc switch 432 and the media port 433 where by a blank 1.44 MB diskette and the blank compact disc are dispensed. For instance, the customer may purchase a blank compact disc after depositing money in the amount deposit acceptor 400A which is then dispensed in a media port 433.

Referring to FIG. 5 and FIG. 6, the program operation of the present invention is described in more detail. As shown in FIG. 4 the computer control unit 400 through the monitor 424 periodically displays suitable advertising and publicity messages the computer memory or drives 400D when the vending machine is idle. The displayed advertising or message on the monitor 424 can be from the merchandisc manufacturer vendor or the property owner of the vending location. The speakers 420 and 421 and headphones 430 play the appropriate audio corresponding to the advertising messages.

When a customer deposits an amount of money into the amount deposit acceptor 400A, the computer unit 400 senses

the input and by means of signals recalled from the programmable audio-video message storage unit 416, checks the amount deposited. For credit card purchase, the computer 400 requests for and checks personal identification number, and records the credit card sales on programmable audio-video message storage 416 using standard hardware and software known in the industry.

When the customer desires to cancel a purchase, the coin return lever 425 is pulled to return the amount to the delivery receptacle 404. This also will cancel the credit card entries in the programmable audio-video message storage 416 and the vending machine returns to an idle state.

When the full payment has been made for the selected merchandise, the computer 400 actuates the monitor 424 to display the pre-selected message which can be, for example, the homepage of the vendor. The computer 400 includes a modem and appropriate operating software for connecting the computer with an internet site. The monitor 424 then displays a series of questions for the customer to interface with the computer. FIG. 7 shows an example of the display inquiry on the monitor 424 which are recalled from the programmed audio-video message storage unit 416. The computer 400 again recalls one of the audio messages stored thereon to accompany the display inquiry in the form of spoken or synthesized words reproduced by the amplifier 419 and through the speakers 410 and 421. By way of example and not limitation, the audio message played on the speakers may be "PLEASE ENTER NUMBER FROM KEYPAD OR CLICK NUMBER USING TRACKBALL OR PRESS MERCHANDISE SELECTOR SWITCH TO SELECT MERCHANDISE."

When the customer selects the merchandise as instructed by the displays on the monitor 424 and through the speakers 420 and 421 the computer 400 senses the action by means of the signal from the keypad 412, or the trackball 410, or from the merchandise selector switch 400B. When the merchandise is selected, the computer 400 accesses the internet provider or website of the manufacturer of the merchandise and displays the audio-visual image advertisement of the merchandise on the monitor 424 as shown on FIG. 8. By way of example and not limitation, the customer can be connected to the website of the manufacturer or distributor for news, sports, and upcoming events. The computer 400 then controls the merchandise dispense mechanism 409 to dispense the purchased item to the merchandise port. The computer then displays the messages on monitor 424 as shown in FIG. 9. The messages are recalled by the computer 400 from the programmed audio-video message storage 416. The displayed messages are accompanied by spoken or synthesized words and music reproduced by the amplifier 419 and through the speakers 420 and 421. By way of example and not limitation, the audio message played on the speakers may be "TO BROWSE VENDOR HOMEPAGE PRESS OR CLICK ONE, TO ACCESS OTHER WEBSITES PRESS OR CLICK TWO, TO END ALL OPERATIONS PRESS OR CLICK THREE."

When the customer selects No. 1 reading from the screen shown in FIG. 9, the computer 400 detects the input signal input from the keypad 412 or trackball 410. The computer 400 then displays the vendor homepage with images, messages and information for advertising and publicity on the monitor 424 as transmitted from the internet provider. The display is accompanied by spoken or synthesized words and music reproduced through the speakers 420 and 421. Using the trackball 410 the customer may browse the vendor homepage for a predetermined time. After the allotted time

elapses, the display "TERMINATION" appears on the monitor 424 to end the browsing and returns the vending machine to idle state.

When the customer selects No. 2 reading from the screen of FIG. 9, the computer 400 detects the input signal from the keypad 412 or trackball 410. The computer 400 displays the vendor homepage with messages and information on the monitor 424 with the messages recalled from the programmed audio-video message storage 416 and played through the speakers 420 and 421. In addition, the customer is requested to deposit amount in the amount deposit 400A to enable the customer to access other websites or homepages. The screen of FIG. 10 shows for example a message that is displayed on the monitor 424, when coin, bill or credit card is inserted into the amount deposit acceptor 400A, the computer 400 senses the action and compares the deposit amount with the amount recalled from the programmed audio-video message storage unit 416 for checking. For example, the computer 400 displays the messages on the monitor screen 424 as shown in FIG. 11.

When the customer selects No. 1 reading from the screen of FIG. 11, the computer 400 again detects the input signal from the keypad 412 or the trackball 410. The computer 400, for example, accesses the internet through the transil-receive network 429 and displays the screen of FIG. 12 on the monitor 424. When the customer selects No. 1 from the screen of FIG. 12 representing "News A Website" by using the keypad 412 or the trackball 410, for instance, the homepage of the news website is displayed on the monitor 400 with images, spoken or synthesized words reproduced by the amplifier 419 through the speakers 420 and 421. By using the trackball 410, the customer may browse the homepage of the news website.

When the customer selects No. 2 reading from the screen of FIG. 11, the computer 400 detects and the input signal from the keypad 412 or trackball 410. The computer 400, for instance, displays the screen of FIG. 13 on the monitor 424. The message screen displayed on the monitor 424 as shown in FIG. 13 is similar to the message screen obtained from other commercial browser software available on the market. By way of example, Netscape™ commercial software may be the browsing software. The customer may then enter the address of the website by using the keypad 412. Search word or words may be entered in place of the address of the website. The monitor 424 displays the website and the customer can browse the website with the keypad 412 and the trackball 410. A message screen corresponding to the display on the monitor 424 or other messages may be produced from the speakers 420 and 421.

The display of "Time Left To Browse Websites X:X Deposit Amount To Increase Time Left" shown in the screen of FIGS. 9 through 13 is provided to limit the operating time by the user so that the customer may deposit extra amount into the amount deposit acceptor 400A to increase browsing time. The process of depositing the amount of money and actuation of the computer is as described above. When there is more browsing time left, the customer may access as many websites as described.

An additional embodiment of the present invention provides the write drive 400D, camera 423 and microphone 422 to allow the customer a two-way interactive communication functions. By way of example and not limitation, the customer may access a musical studio transmitted to the speakers 420 and 421, selects some tracks and download the tracks onto blank compact disc or other recording medium inserted into the read-write drive 400D after depositing a